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FINAL CLOSURE REPORT REMEDIAL ACTION AT OIL SATURATED AREA AND HAZARDOUS WASTE DRUM STORAGE AREA KANSAS CITY MO

5/1/1992

BURNS & MCDONNELL

CONTRACT NO: F23608-91-D0020-5005
RG 91-0045, REMEDIAL ACTION SITE SS03/SS04
OIL SATURATED AREA AND
HAZARDOUS WASTE DRUM STORAGE AREA
RICHARDS-GEBAUR AIR FORCE BASE, MISSOURI

FINAL
CLOSURE REPORT

MAY 1992

91-804-3-008
USRGAFB

Burns & McDonnell
Engineers-Architects-Consultants
Kansas City, Missouri

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1.0 INTRODUCTION

1.0 INTRODUCTION

1.1 SCOPE OF WORK

In accordance with the Scope of Work, this Site Closure Report has been prepared by Burns & McDonnell for Richards-Gebaur Air Force Base (RGAFB) to detail the field activities associated with the removal of petroleum contaminated soil from the Oil Saturated Area (Site SS03) and the Hazardous Waste Drum Storage Site (Site SS04). Included in this report are a discussion of field activities including excavation, sampling, and backfilling; analytical results of soil sampling; disposal of excavated soil; laboratory and field quality assurance/quality control; and conclusions and recommendations for both sites. Included in the appendices of this report are the chain-of-custody forms, the laboratory analytical results, and the laboratory quality control reports.

1.2 SITE LOCATIONS

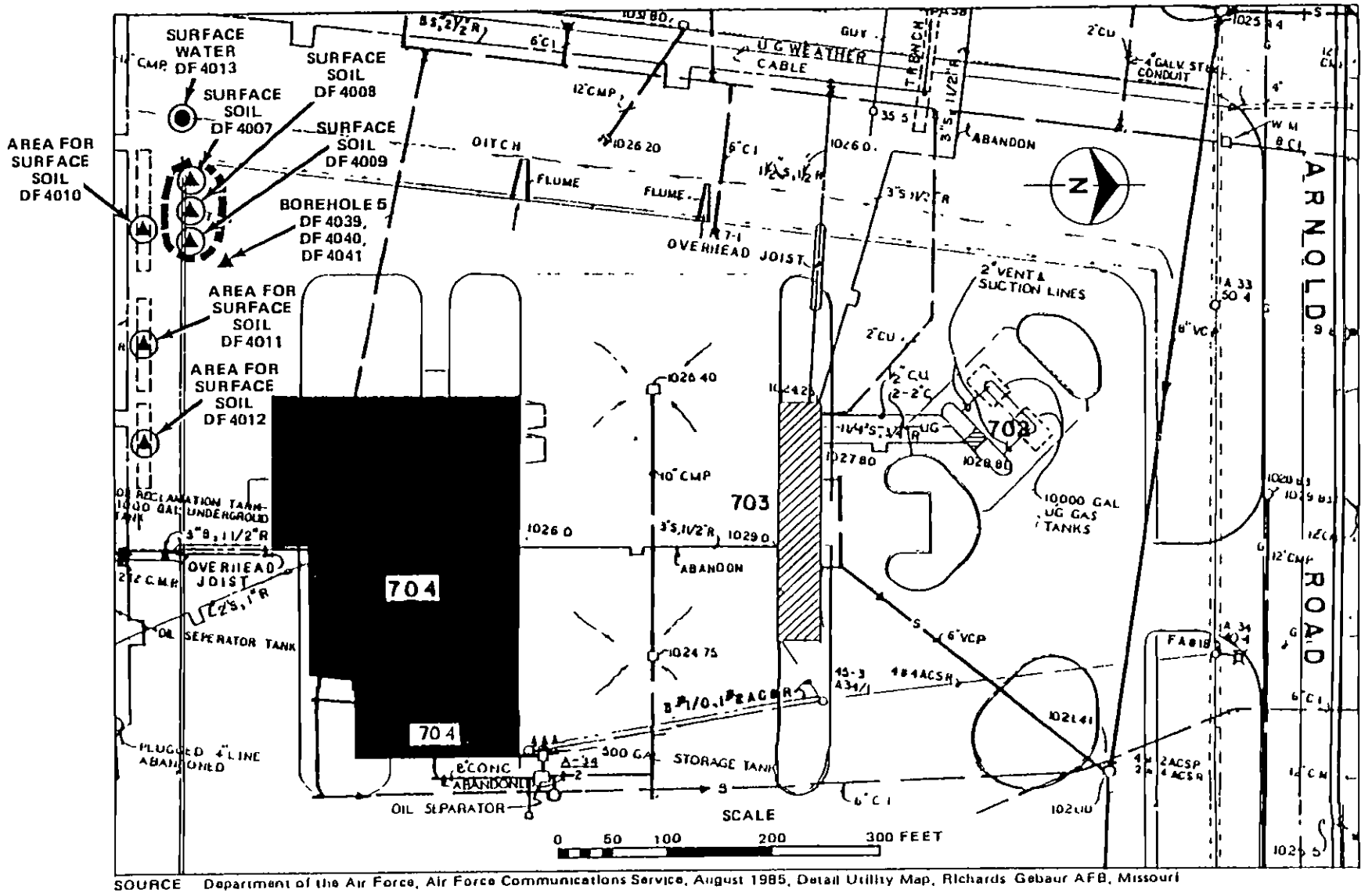
RGAFB is located in west-central Missouri, about 2.6 miles east of the Kansas-Missouri state line, as shown on Figure 1. The Base is almost equally divided by the Jackson-Cass county line, which runs east-west through the middle of the Base. In Cass County, the Base is bounded by the city of Belton on the east and south and in Jackson County, the Base is bounded by Kansas City Downtown Kansas City is about 18 miles to the north. Grandview is about 3 miles to the northeast and Belton is about 3 miles to the southeast. The main access to the Base is off of U.S. Highway 71 (Reference 1). The Oil Saturated Area (Site SS03) is located to the southwest of Building 704 in the central part of the RGAFB (see Figure 2). The Hazardous Waste Drum Storage Site (Site SS04) is located to the southwest of Building 923 and to the northwest of Building 924 in the central part of RGAFB (see Figure 2).

1.3 SITE HISTORIES

1.3.1 Oil Saturated Area - Site SS03

Site SS03 was originally used to store waste engine oils and waste transmission fluids originating from vehicle maintenance conducted in Building 704. Spillage due to waste transfer, overfilled drums, and leaking drums had discolored the surface soils in this area. In 1980, a gravel cover was placed over the area to stabilize the oil-saturated soils. In 1986, approximately one-half of the site was paved with asphalt and then overlain with asphalt in 1989 (Reference 2).

Since 1983, Site SS03 has been the subject of studies which confirmed that site contamination is limited to petroleum-based organics and lead (Reference 2). In October 1986, the site was tested for purgeable aromatics, purgeable halocarbons, total petroleum hydrocarbons (TPH), and lead (see Figure 3). In August 1989, this site was tested for purgeable aromatics, purgeable halocarbons,base/neutral and acid extractables, and total metals (see Figure 4) (Reference 2). A summary of the analytical results for this site is compiled in Table 1. The volume of contaminated soil at the Oil Saturated Area was estimated by RGAFB to be approximately 20 cubic yards and limited to the top 3 feet (deepest contamination encountered) of soil. Prior to the soil removal, a 6-foot by 16-foot tin shed was located directly over Site SS03.



SOURCE Department of the Air Force, Air Force Communications Service, August 1985, Detail Utility Map, Richards Gebaur AFB, Missouri

KEY.
- Site Boundary
- Surface Runoff Direction
- Subsurface Soil Sampling Location
- Surface Soil Sampling Location
- Groundwater Sampling Location
- Surface Water Sampling Location

FROM "INSTALLATION RESTORATION PROGRAM, PHASE II, CONFIRMATION/QUALIFICATION STAGE 2," ECOLOGY AND ENVIRONMENT, INC JULY 1988

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Figure 3
OCTOBER 1986
SAMPLE LOCATIONS,
OIL SATURATED AREA
SITE SS03

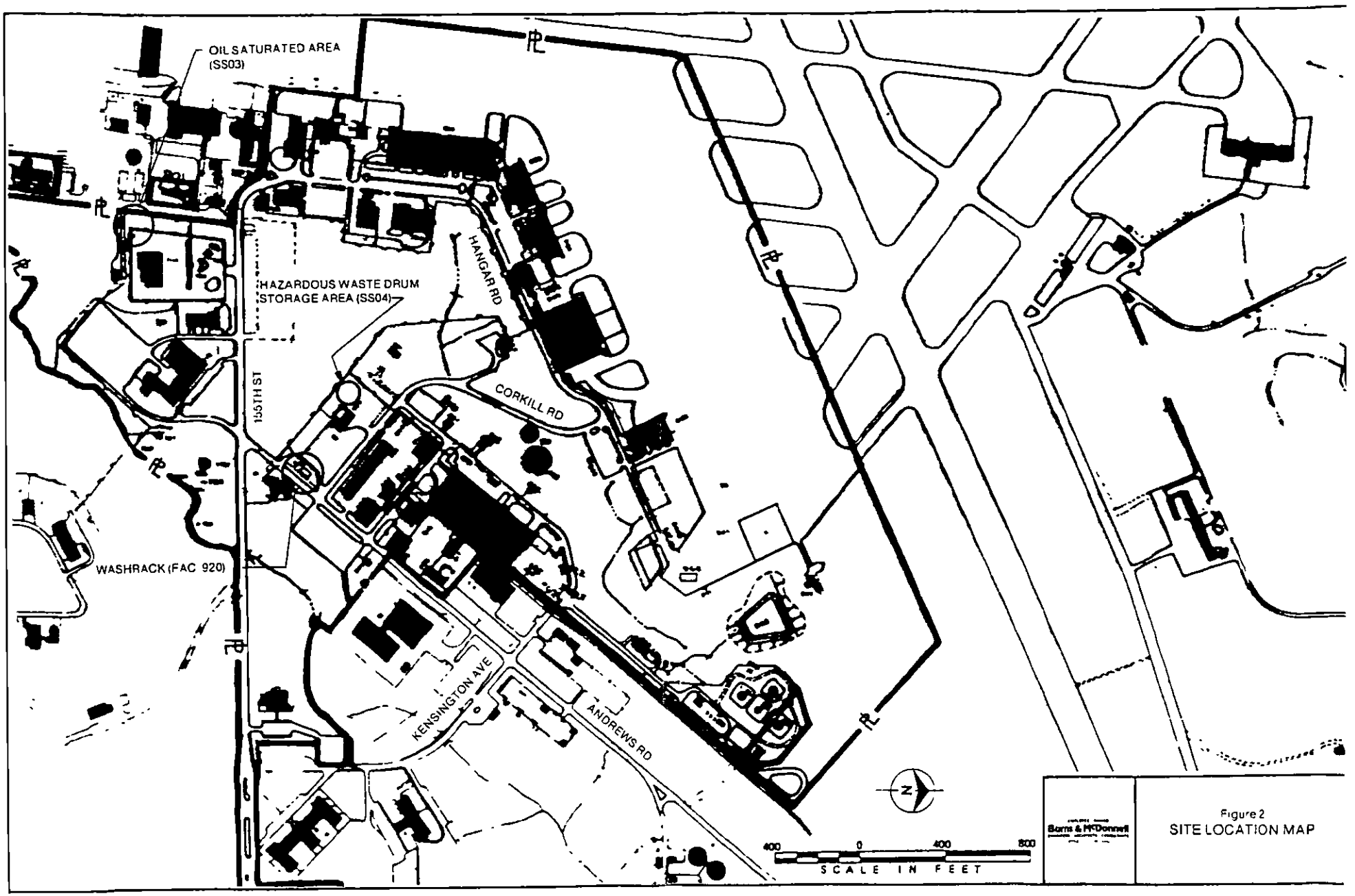

Figure 2
SITE LOCATION MAP

TABLE 1

PREVIOUS ANALYTICAL SAMPLE RESULTS
OIL SATURATED AREA, SITE SS03

DATE	MEDIA	DEPTH	SAMPLE ID	PARAMETER	RESULTS	DETECTION LIMIT
10/86	soil	0'-1'	DF4007	TPH	2000 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	169 ppm	1 ppm
10/86	soil	0'-1'	DF4008	TPH	3800 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	117 ppm	1 ppm
10/86	soil	0'-1'	DF4009	TPH	600 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	343 ppm	1 ppm
10/86	soil	0'-1'	DF4010	TPH	ND	1 ppm
				VOCs	ND	1 ppm
				Lead	14.1 ppm	1 ppm
10/86	soil	0'-1'	DF4011	TPH	2 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	14.8 ppm	1 ppm
10/86	soil	0'-1'	DF4012	TPH	3 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	18.5 ppm	1 ppm
10/86	soil	3'-4'	DF4039	TPH	9.0 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	20.2 ppm	1 ppm
10/86	soil	5'-6'	DF4040	TPH	ND	1 ppm
				VOCs	ND	1 ppm
				Lead	9.22 ppm	1 ppm
10/86	soil	15.5'-16.5	DF4041	TPH	ND	1 ppm
				VOCs	ND	1 ppm
				Lead	10.2 ppm	1 ppm
10/86	water	0'	DF4013	TPH	ND	1 ppm
				VOCs	ND	0.02-2 ppb
				Lead	ND	5 ppb
				TDS	270	NA

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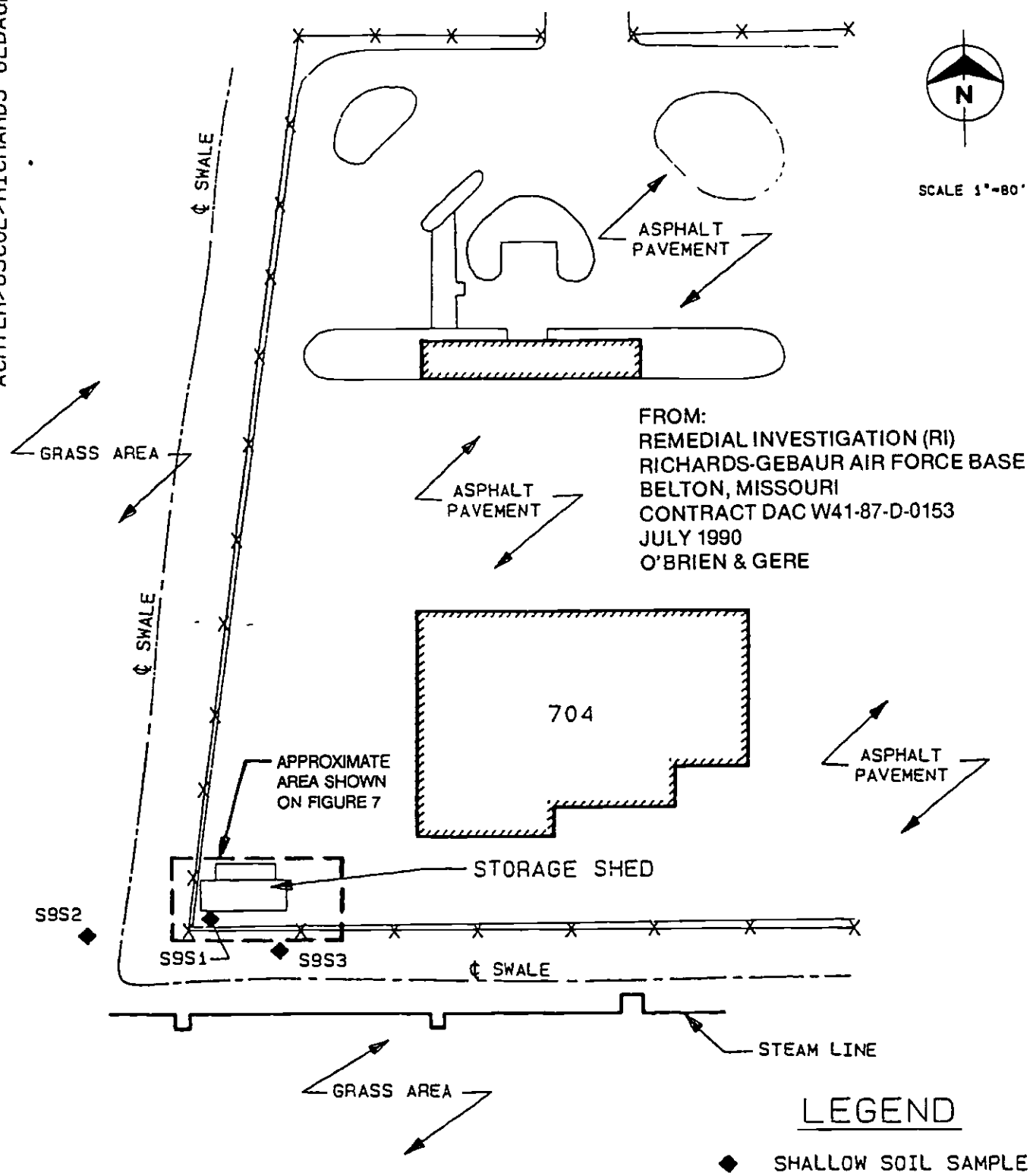


Figure 4
AUGUST 1989 SAMPLE LOCATIONS, OIL SATURATED AREA, SITE SS03

TABLE 1

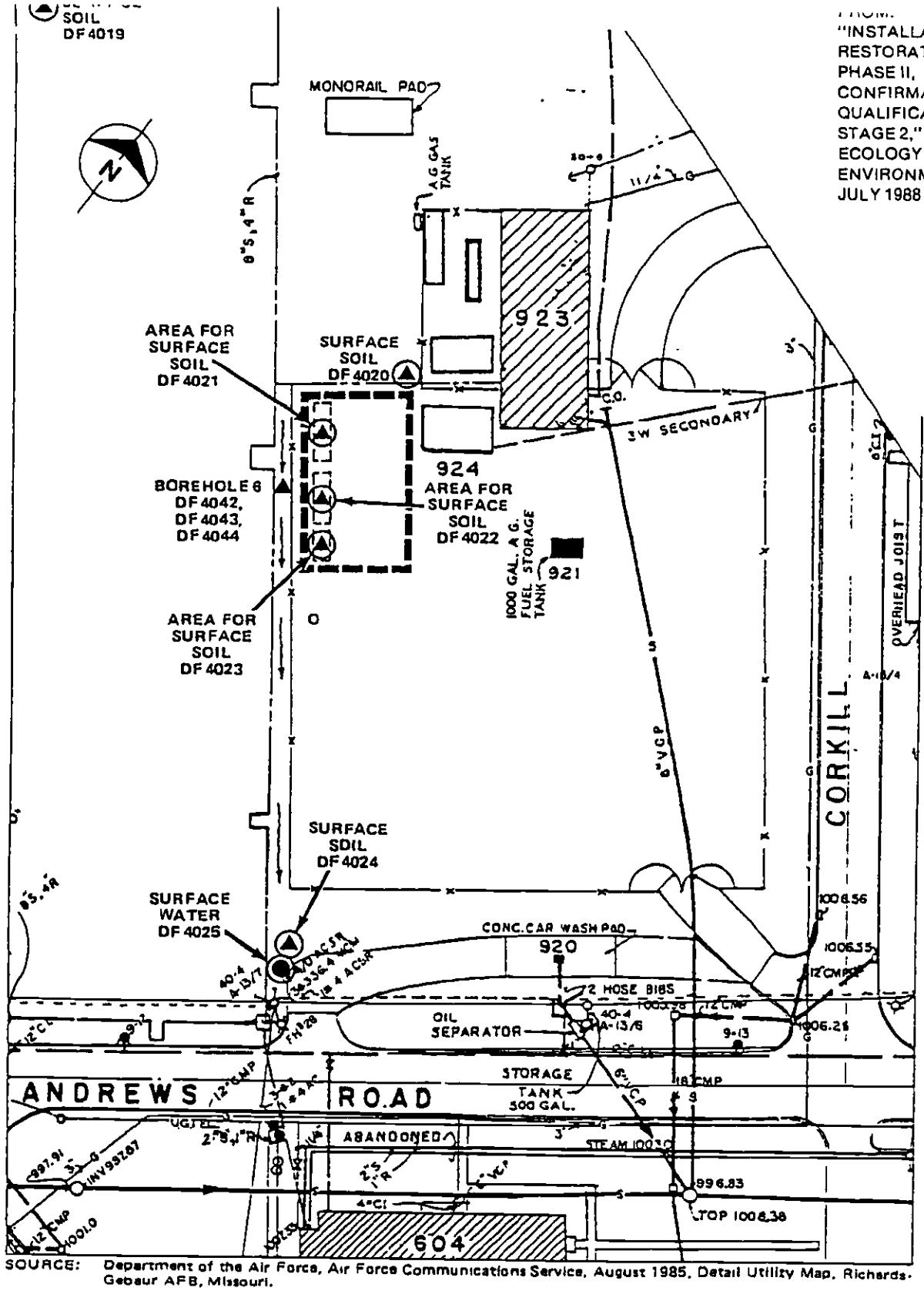
PREVIOUS ANALYTICAL SAMPLE RESULTS
OIL SATURATED AREA, SITE SS03
(con't)

DATE	MEDIA	DEPTH	SAMPLE ID	PARAMETER	RESULTS	DETECTION LIMIT
8/89	soil	0'-1'	S9S1	VOCs	ND	6-12 ppb
				BNAs	ND	0.02-2 ppb
				Lead	94 ppm	.5 ppm
8/89	soil	0'-1'	S9S2	VOCs	ND	6-11 ppb
				BNAs	ND	0.02-2 ppb
				Lead	20 ppm	0.5 ppm
8/89	soil	0'-1'	S9S3/4	VOCs	ND	6-12 ppb
				BNAs	ND	0.02-2 ppb
				Lead	107 ppm	0.5 ppm

1.3.2 Hazardous Waste Drum Storage Area - Site SS04

Site SS04 was used for an undetermined number of years for storage of drums of waste oil (primarily waste engine oil) prior to disposal. No hazardous materials have been stored in the area since 1985. A portion of the area was overlain with asphalt in 1989. During the operational period of this waste storage area, soil contamination originated from either transfer spillage, drum overfilling, or drum leaks. Since 1983, Site SS04 has been the subject of three studies confirming that Site SS04's contamination is limited to petroleum-based organics (Reference 2).

In October 1986, Site SS04 was tested for purgeable aromatics, purgeable halocarbons, TPH and lead (see Figure 5) (Reference 2). In August 1989, Site SS04 was tested for purgeable aromatics, purgeable halocarbons, and base/neutral and acid extractables (see Figure 6) (Reference 2). A summary of the analytical results for Site SS04 is compiled in Table 2. The volume of contaminated soil at Site SS04 was estimated by RGAFB to be approximately 23 cubic yards.



"INSTALLATION RESTORATION PROGRAM, PHASE II, CONFIRMATION/ QUALIFICATION STAGE 2," ECOLOGY AND ENVIRONMENT, INC JULY 1988

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SOURCE: Department of the Air Force, Air Force Communications Service, August 1985, Detail Utility Map, Richards-Gebaur AFB, Missouri.

KEY:
- Site Boundary
- Surface Runoff Direction
- Subsurface Soil Sampling Location
- Surface Soil Sampling Location
- Groundwater Sampling Location
- Surface Water Sampling Location

SCALE
0 50 100 200 300 FEET

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Figure 5
OCTOBER 1986
SAMPLE LOCATIONS,
HAZARDOUS WASTE
DRUM STORAGE AREA
SITE SS04

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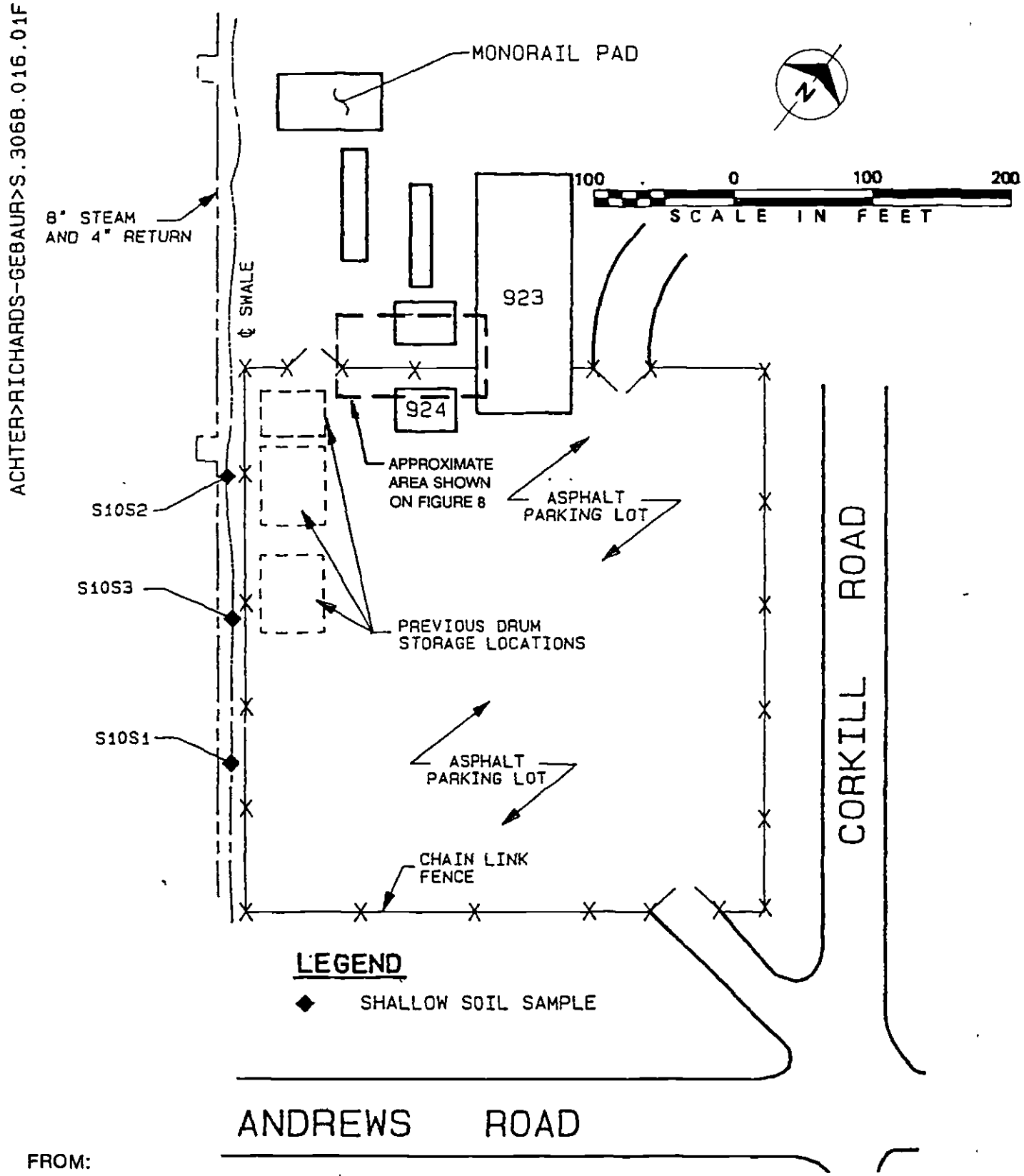

FROM:
REMEDIAL INVESTIGATION (RI)
RICHARDS-GEBAUR AIR FORCE BASE
BELTON, MISSOURI
CONTRACT DAC W41-87-D-0153
JULY 1990
O'BRIEN & GERE

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Figure 6
AUGUST 1989
SAMPLE LOCATIONS
HAZARDOUS WASTE DRUM
STORAGE AREA, SITE SS04

TABLE 2

PREVIOUS ANALYTICAL SAMPLE RESULTS
HAZARDOUS WASTE DRUM STORAGE AREA, SITE SS04

DATE	MEDIA	DEPTH	SAMPLE ID	PARAMETER	RESULTS	DETECTION LIMIT
10/86	soil	0'-1'	DF4019	TPH	ND	1 ppm
				VOCs	ND	1 ppm
				Lead	ND	0.5 ppm
10/86	soil	0'-1'	DF4020	TPH	1900 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	ND	0.5 ppm
10/86	soil	0'-1'	DF4021	TPH	55 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	ND	0.5 ppm
10/86	soil	0'-1'	DF4022	TPH	46 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	ND	0.5 ppm
10/86	soil	0'-1'	DF4023	TPH	140 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	ND	0.5 ppm
10/86	soil	0'-1'	DF4024	TPH	2.9 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	0.99	0.5 ppm
10/86	water	0'	DF4025	TPH	ND	1 ppm
				VOCs	ND	.2-2 ppb
10/86	soil	0.5'-1.5'	DF4042	TPH	ND	1 ppm
				VOCs	ND	1 ppm
				Lead	0.99	1 ppm
10/86	soil	4.5'-5.5'	DF4044	TPH	1.2 ppm	1 ppm
				VOCs	ND	1 ppm
				Lead	0.99	1 ppm
10/86	soil	9.0'-10.5'	DF4043	TPH	ND	1 ppm
				VOCs	ND	1 ppm
				Lead	0.99	1 ppm

TABLE 2

PREVIOUS ANALYTICAL SAMPLE RESULTS
HAZARDOUS WASTE DRUM STORAGE AREA, SITE SS04
(con't)

DATE	MEDIA	DEPTH	SAMPLE ID	PARAMETER	RESULTS	DETECTION LIMIT
8/89	soil	0'-1'	S10S1	VOCs	ND	6-12 ppb
				BNAs	ND	0.02-2 ppb
				Lead	50 ppm	0.5 ppm
8/89	soil	0'-1'	S10S2	VOCs	ND	6-11 ppb
				BNAs	ND	0.02-2 ppb
				Lead	41 ppm	0.5 ppm
8/89	soil	0'-1'	S10S3/4	VOCs	ND	6-12 ppb
				BNAs	ND	0.02-2 ppb
				Lead	72 ppm	0.5 ppm

2.0 SUMMARY OF FIELD ACTIVITIES

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2.1 GENERAL

Field activities during remediation at the two sites included pavement removal, excavation and stockpiling of petroleum and lead contaminated soil, exposed subgrade soil sampling, and the backfilling of the excavations with clean material. Burns & McDonnell personnell were present during remediation field activities.

Ten days prior to the start of excavation, a digging permit (AF Form 103) was obtained from the RGAFB Civil Engineering and appropriate utilities were cleared. Prior to the start of field activities, RGAFB removed all fencing and structures in the excavation areas.

2.2 PAVEMENT REMOVAL

All asphalt pavement was removed prior to the start of excavation on November 19, 1991. The areas of pavement removal are shown on Figures 7 (Site SS03) and 8 (Site SS04). The asphalt was demolished and removed with a backhoe. The demolished asphalt was stockpiled on plastic sheeting in the immediate area of the excavation.

2.3 SOIL REMOVAL

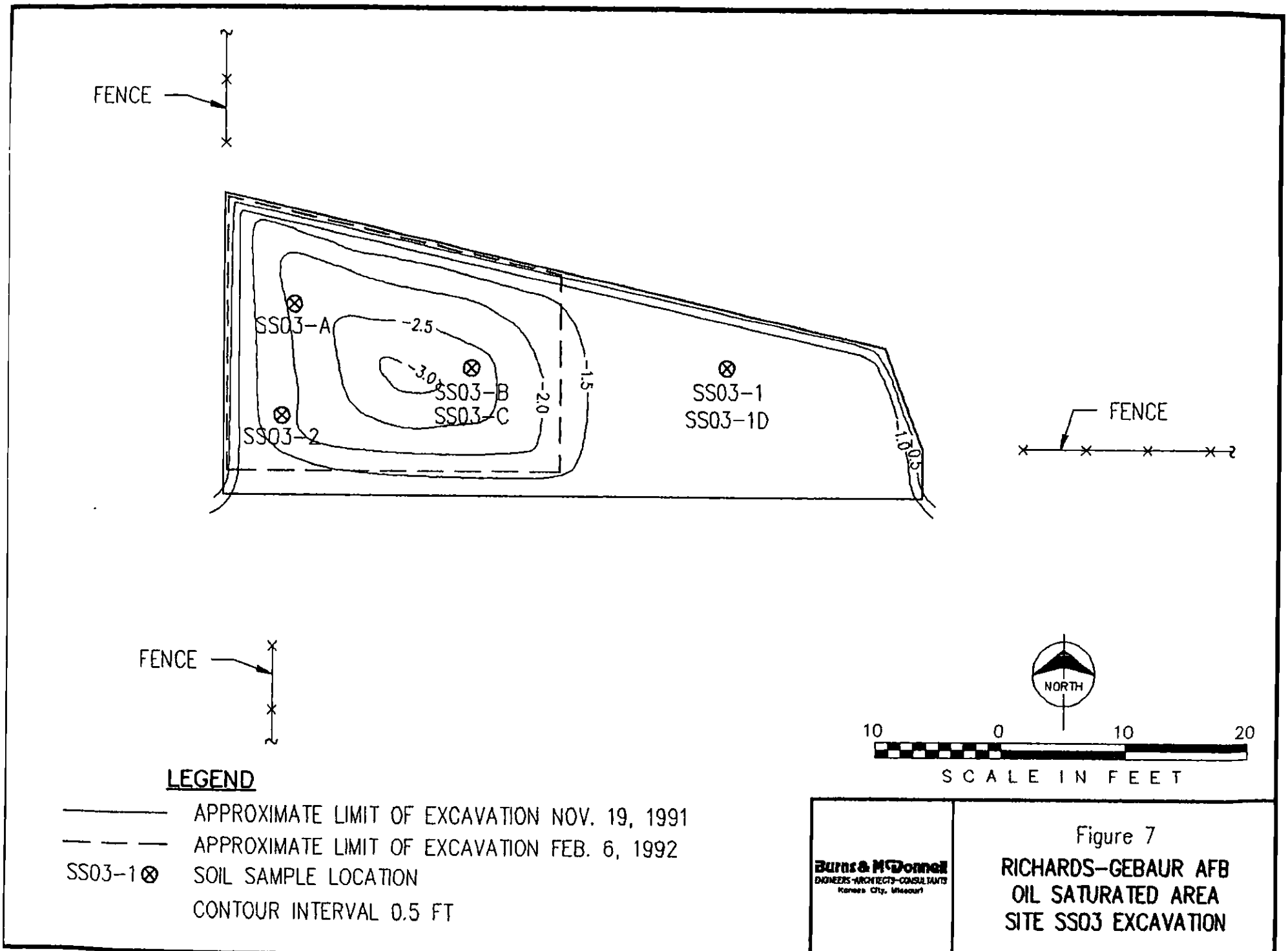
Upon completion of the pavement removal, the petroleum contaminated soil was excavated on November 19, 1991. Approximately 27 cubic yards were removed at Site SS03 and 15 cubic yards were removed at Site SS04. Excavation limits are indicated on Figures 7 and 8. The soil was removed in layers and screened with a photoionization detector (PID). PID readings were 0 ppm. Soil was excavated at Site SS03 to a depth approximately 24 inches below grade. At Site SS04, the depth of the excavation ranged from 12 inches in the northwest portion of the excavation, to 30 inches in the southeast portion.

At Site SS03, laboratory chemical testing indicated that further excavation was needed. On February 6, 1992, an additional 15 cubic yards of soil were excavated. The excavated soil was stockpiled separately from that previously excavated.

The excavated soil was stockpiled on plastic sheeting in the vicinity of the excavation. The stockpiled soil was covered with plastic sheeting for protection from weather conditions.

2.4 SUBGRADE SAMPLING

Subgrade sampling was performed as described in Part 3.0 of this Closure Report. The excavations remained open while the soil samples were analyzed for lead and TPH. The excavations were protected with plastic sheeting to



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Kansas City, Missouri

Figure 7

RICHARDS-GEBAUR AFB
OIL SATURATED AREA
SITE SS03 EXCAVATION

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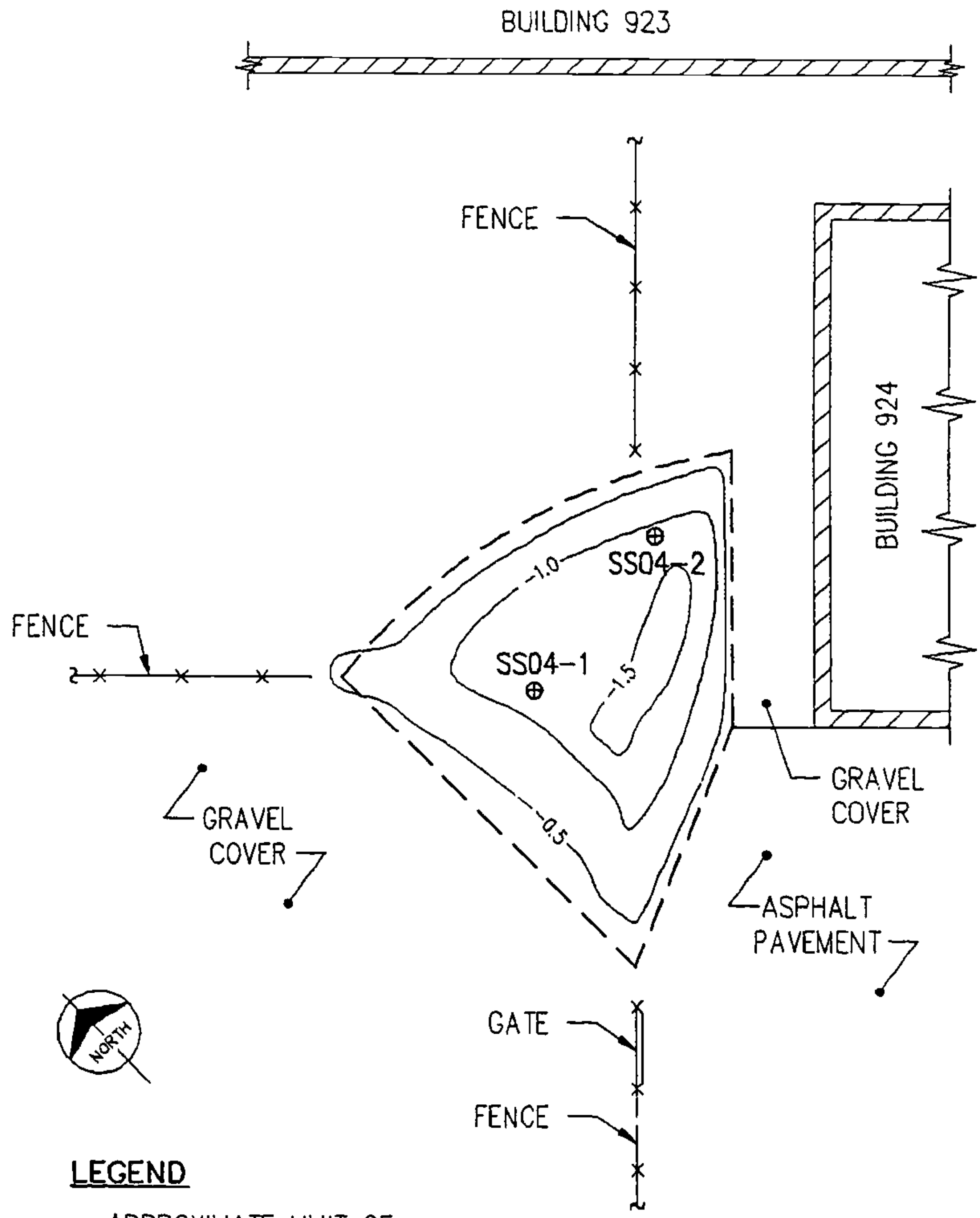

LEGEND

- - - - APPROXIMATE LIMIT OF EXCAVATION NOV. 19, 1991

SS04-1 ⊕ SOIL SAMPLE LOCATION

CONTOUR INTERVAL 0.5 FT

10 0 10 20

SCALE IN FEET

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Kansas City, Missouri

Figure 8
RICHARDS-GEBAUR AFB
HAZARDOUS WASTE DRUM
STORAGE AREA
SITE SS04 EXCAVATION

minimize the infiltration of rainwater into the subsurface. Sandbags were placed around the excavation to isolate it from runoff. Any surface runoff was pumped out onto the ground surface immediately adjacent to the excavation prior to backfilling.

2.5 BACKFILLING THE EXCAVATIONS

The excavations were backfilled with clean fill material. The material was placed in the excavation in loose lifts not exceeding 6 to 8 inches and compacted. The excavations were backfilled to the surrounding subgrade elevation.

2.6 RESURFACING OF EXCAVATION AREAS

The excavation areas were resurfaced to approximately equal the original conditions. At Site SS03, asphalt was placed in the parking area to the original thickness and the former grassy areas were sodded. At Site SS04, gravel was placed so that the site was returned to its original condition.

2.7 DECONTAMINATION OF EXCAVATION EQUIPMENT

Equipment used for excavation of contaminated soil was decontaminated prior to and following excavation of contaminated soil from each area. The decontamination procedures were conducted at the washrack, Facility 920. The excavation equipment was decontaminated with a steam cleaner until all visible soil had been removed.

2.8 DISPOSAL OF THE ASPHALT AND EXCAVATED SOIL

RGAFB contracted with Environmental Specialist, Inc. of Kansas City, Missouri to dispose of the asphalt and soil excavated at Sites SS03 and SS04 along with other petroleum contaminated soil. On February 2 and 3, A.E. Wolfe Environmental Services of Kansas City, Missouri transported the asphalt and soil from the sites to Johnson County Landfill of Warrensburg, Missouri. The disposal documents for the asphalt and soil can be found in Appendix A.

* * * * *

3.0 SOIL SAMPLING AND ANALYSIS

3.0 SOIL SAMPLING AND ANALYSIS

3.1 SOIL SAMPLING PROCEDURES FOR CHEMICAL ANALYSIS

Upon completion of the excavation of the contaminated soil on November 19, 1991, two soil samples were collected from each excavation. The sample locations were chosen based on visual inspection of the excavation floor. Sample locations are shown on Figures 7 and 8.

At Site SS03, the laboratory chemical testing of the soil samples obtained on November 19, 1991, indicated that further excavation was needed. An additional 15 cubic yards of soil was removed and the subgrade was again sampled on February 6, 1992.

Soil samples were collected from undisturbed soil in the exposed subgrade of the excavation. Each soil sample was obtained by placing the soil in the sample container with a precleaned stainless steel spatula. The soil was packed tightly in the sample container with a minimum amount of airspace present. In addition, for each sample location, a sample container was partially filled and a static headspace reading was obtained using a properly calibrated PID. Headspace readings for the soil samples are summarized in Table 3.

Composite soil samples were obtained from the excavated soil stockpile for the purpose of determining the proper disposal of the soil. The location of the stockpiles and the composite soil samples are shown on Figures 7 and 8. Each composite soil sample was composed of four approximately equal aliquots. The aliquots were placed in a precleaned stainless steel bowl and mixed thoroughly. Using a clean spatula, a sample container was filled from the composited sample. A separate sample container was partially filled and a static headspace reading was obtained using a properly calibrated PID. Headspace readings are summarized on Table 3.

Disposable gloves were used in handling soil samples to avoid possible cross-contamination of samples. Gloves were changed between each sample. All soil samples obtained were placed in laboratory cleansed glass sample bottles. The sample bottles were labeled indicating sample number and location. The sample was stored in an ice chest and chilled to approximately 4 degrees C prior to shipment to the laboratory.

3.2 DUPLICATE AND RINSATE SAMPLES

One duplicate soil sample and one rinsate sample were obtained and analyzed for TPH and lead on November 19, 1991, and for TPH on February 6, 1992. The duplicate soil sample was collected by placing the soil sample into a clean stainless steel bowl. The sample was mixed thoroughly and then split into two samples. One sample was considered the original, while the other was the duplicate. The duplicate sample was identified with a unique sample identification number. The sample station where the duplicate was collected was noted in the field logbook.

An equipment rinsate blank was prepared for the sampling equipment used to collect subsurface soil samples for chemical analyses. To prepare the

TABLE 3
SUMMARY OF HEADSPACE READINGS

Site	Soil Sample No.	Headspace Readings (ppm)
SSO3	SSO3-1	0
	SSO3-2	12
	SSO3-SP	40
	SSO3-A	0
	SSO3-B	0
	SSO3-SP92	67
SS04	SS04-1	0
	SS04-2	0
	SS04-SP	0

equipment rinsate blank, High-Performance-Liquid-Chromatographic (HPLC) - grade water (ASTM Type II) was used to rinse the decontaminated sampling equipment. The rinsate was placed directly into the container. The equipment rinsate was analyzed for the same constituents as the primary sample.

3.3 SAMPLE ANALYSIS

All soil and water samples collected on November 19, 1991, were analyzed for TPH and lead using EPA Methods 418.1 modified and 7420, respectively. Soil and water samples collected on February 6, 1992, were analyzed for TPH using EPA Method 418.1 modified.

3.4 SAMPLE PRESERVATION

Soil samples analyzed for TPH or lead were collected in glass jars. The rinsate sample analyzed for TPH was collected in a 16 oz. amber glass jar. The rinsate sample for lead was collected in an 8 oz. polyethylene container with a HNO_3 preservative. The samples were stored in an ice chest and chilled to approximately 4 degrees C prior to shipment to the laboratory.

3.5 SOIL SAMPLING EQUIPMENT DECONTAMINATION PROCEDURES

All soil sampling equipment was decontaminated prior to obtaining each soil sample. The equipment was cleaned using fresh potable water and Alconox (detergent) solution followed by a distilled water rinse.

* * * * *

4.0 GEOLOGY

4.0 GEOLOGY

4.1 GEOLOGY

The RGAFB is located in the Osage Plains region of the Central Lowlands physiographic province (Reference 3). The bedrock present beneath Sites SS03 and SS04 is the Lane Formation as indicated by a geologic map in Reference 4. The Lane Formation is Pennsylvanian in age and consists of a grey micaceous shale of generally low permeability.

Soils at the RGAFB consist primarily of very thin loess deposits over residual soils derived from the in-place weathering of limestone and shale (Reference 5 and 6). The soils underlying Sites SS03 and SS04 consist of the Macksburg-Urban land complex. The Macksburg series consists of deep, gently sloping, poorly drained silty clay loams with moderate permeability and medium surface runoff. The urban land part of the complex is covered by streets, parking lots, buildings, and other structures.

4.2 SITE SOILS

4.2.1 Site SS03

Site SS03 was covered with approximately 4 inches of asphalt over 4 inches of concrete. Beneath the concrete was approximately 11 inches of subbase consisting of poorly graded gravel with sand and silt. Underlying the subbase to the total depth of the excavation was a moist, silty clay. The clay was bluish-gray in color, had a high plasticity, and was stiff in consistency.

4.2.2 Site SS04

Site SS04 was covered with approximately 6 inches of gravel. The gravel was poorly graded with clay and silt and was underlain by a moist silty clay. The clay was brownish-grey in color, had a medium to high plasticity, and was stiff in consistency.

* * * * *

5.0 ANALYTICAL RESULTS

5.0 ANALYTICAL RESULTS

5.1 SITE SS03

Upon completion of the soil excavation on November 19, 1991, two soil samples, SS03-1 and SS03-2, were obtained from the subgrade floor of the excavation. Soil Sample SS03-1D was obtained as a duplicate of SS03-1. All of the samples were analyzed for TPH and lead (see Table 4) by Southwest Laboratory of Broken Arrow, Oklahoma. The laboratory analytical reports can be found in Appendix B. TPH levels of 33, 22, and 28,000 mg/kg and lead levels of 21.2, 20.6, and 22.6 mg/kg were reported for Soil Samples SS03-1, SS03-1D, and SS03-2, respectively. Because Soil Sample SS03-2 exceeded the clean-up goal of 100 mg/kg TPH, further excavation was deemed to be necessary at Site SS03. None of the soil samples obtained exceeded the lead clean-up level of 238 mg/kg.

Additional excavation was conducted at Site SS03 on February 6, 1992. Soil Samples SS03-A and SS03-B were obtained from the subgrade of the excavation. Soil Sample SS03-C was a duplicate of SS03-B. The soil samples were only analyzed for TPH. TPH levels of 53 mg/kg, 12 mg/kg, and nondetect (< 10 mg/kg) were reported for Soil Samples SS03-A, SS03-B, and SS03-C, respectively. Because these levels were below the clean-up goal of 100 mg/kg TPH, it was decided to close Site SS03.

Soil Sample SS03-SP was obtained from the stockpile of soil excavated on November 19, 1991. TPH and lead levels for Soil Sample SS03-SP were reported as 5,100 mg/kg and 63 mg/kg, respectively. Soil Sample SS03-SP92 was obtained from the stockpile of soil excavated on February 6, 1992. Soil Sample SS03-SP92 contained a reported TPH level of 2,000 mg/kg.

5.2 SITE SS04

Upon completion of the soil excavation on November 19, 1991, two soil samples, SS04-1 and SS04-2, were obtained from the subgrade of the excavation. Both soil samples were analyzed for TPH and lead (see Table 4) by Southwest Laboratory of Broken Arrow, Oklahoma. The laboratory analytical reports can be found in Appendix B. TPH levels of 14 and 15 mg/kg and lead levels of 17.1 and 15.4 mg/kg were reported for Soil Samples SS04-1 and SS04-2, respectively. Both soil samples were below clean-up goals of 100 mg/kg TPH and 238 mg/kg lead; therefore, it was decided to close Site SS04.

Soil Sample SS04-SP obtained from the stockpiled soil contained a reported 350 mg/kg TPH and 81 mg/kg lead.

* * * * *

TABLE 4
SUMMARY OF ANALYTICAL RESULTS

Site	Soil Sample Number	Date	TPH (mg/kg)	Lead (mg/kg)
SS03	SS03-1	11/19/91	33	21.2
	SS03-1D[1]	11/19/91	22	20.6
	SS03-2	11/19/91	28000	22.6
	SS03-SP	11/19/91	5100	63.1
	SS03-RB	11/19/91	ND[3]	ND
	SS03-A	2/6/92	53	NA[2]
	SS03-B	2/6/92	12	NA
	SS03-C[4]	2/6/92	ND	NA
	SS03-SP92	2/6/92	2000	NA
	SS03-RB92	2/6/92	ND	NA
SS04	SS04-1	11/19/91	14	17.1
	SS04-2	11/19/91	15	15.4
	SS04-SP	11/19/91	350	81.0

[1] SS03 - 1D is a duplicate of SS03-1
[2] NA - Not analyzed for this parameter
[3] ND - Parameter was not detected in sample
[4] SS03-C is a duplicate of SS03-B

6.0 QUALITY ASSURANCE

6.0 QUALITY ASSURANCE

Eight soil samples, two duplicate soil samples, and two rinsate blanks were obtained and analyzed for Sites SS03 and SS04. A data assessment was made in accordance with the quality assurance objectives set forth in the original Work Plan.

6.1 QUALITY ASSURANCE OBJECTIVES

The principal objectives of the Quality Assurance Project Plan (QAPP) were to maintain the quality of operational activities and document the quality of data generated by the activities described in Parts 2 and 3. Experienced and trained on-site personnel conducted field operations and shipped samples to the laboratory for analysis. The project was staffed with personnel experienced in the technical and management disciplines appropriate for the project activities.

6.1.1 Measurement Objectives

All results were consistent with and representative of the media sampled. All data were reported in consistent units.

6.1.2 Method Detection Limits

The method detection limits set forth in the original laboratory QAPP were met.

6.1.3 Quality Control Parameters

The quality assurance objective for the analytical data was to collect environmental monitoring data of known and acceptable quality. To meet this objective, the quality control parameters of precision, accuracy, representativeness, and completeness are addressed in this section.

6.1.3.1 Precision

No analytes were present above detection limits in the laboratory blank samples.

Two field duplicate pairs were collected during sampling, SS03-1 and SS03-1D, and SS03-B and SS03-C. For field duplicate pair SS03-1 and SS03-1D, relative percent differences (RPDs) were calculated for TPH and lead.

Parameter	SS03-1 (Sample)	SS03-1D (Duplicate)	RPD
TPH	33	22	40%
Lead	21.2	20.6	2.9%

The RPD for TPH was 40 percent. This is above the quality control limit of 35 percent. Because Soil Sample SS03-C was analyzed as nondetect (10 mg/kg) for TPH, no RPDs were calculated for the duplicate sample pair, SS03-B and SS03-C.

6.1.3.2 Accuracy

The laboratory matrix spike/matrix spike duplicate was within quality control limits. No analytes were present above detection limits in the rinsate blanks.

6.1.3.3 Representativeness
The sampling techniques are detailed in Section 3.0 of this report. All field and quality control sampling followed the guidelines listed in the Work Plan.

6.1.3.4 Completeness
The laboratory performed all requested analyses of the soil samples within the holding times specified in the technical services agreement.

6.2 SAMPLE COLLECTION, PRESERVATION, AND STORAGE
The Sample collection procedures and the preservation of the samples are discussed in Section 3.0. The storage of the samples is also discussed in Section 3.0.

6.3 SAMPLE CUSTODY AND DOCUMENTATION
All documentation procedures were followed as presented in the Work Plan. The chain-of-custody records can be found in Appendix C of this report.

6.4 CALIBRATION PROCEDURES
To ensure the quality of data collected in the field, all field instruments were calibrated prior to use. Calibration procedures followed standard manufacturer's instructions to assure that the equipment was functioning within tolerances established by the manufacturer.

6.5 ANALYTICAL PROCEDURES
All soil and water samples collected were analyzed for TPH using EPA Method 418.1 modified. In addition, the soil samples collected on November 19, 1991, were analyzed for lead using EPA Method 7420.

6.6 INTERNAL QUALITY CONTROL
Each soil sample was collected to allow the laboratory to perform the necessary QC checks. Laboratory quality assurance/quality control reports can be found in Appendix D of this report.

* * * * *

7.0 CONCLUSIONS

APPENDIX A

DISPOSAL DOCUMENTS FOR EXCAVATED SOIL

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 442 COMBAT SUPPORT GROUP (AFRES)
RICHARDS-GEBAUR AIR FORCE BASE, MISSOURI 64147-5000

REPLY TO ATTN OF CEEV (Mr Pilcher, 348-2091) 27 April 1992

SUBJECT Disposal of Contaminated Soil, Sites SS03/SS04

TO Burns & McDonnell
William A. Singleton
P.O. Box 419173
Kansas City, MO 64141

1. Copies of disposal documents for the disposal of the contaminated soil for the subject sites is forwarded for your information and inclusion in the site closure plans.

2. For further information pertaining to this subject contact Tom Pilcher at 348-2091.

JOHN P. HURD, GR.
Base Civil Engineer

Atch
Disposal Document

275 37

(Name of Carrier) Carrier's No. SC 0 ~ 1

RECEIVED subject to the classifications and tariffs in effect on the date of the issue of the Bill of Lading.

at Kans. City, MO 64132 04-02 192 From A. E. Wolfe Environmental Services

The property described herein in apparent good order except as noted (contents and conditions of contents of packages unknown) marked consigned and destined as indicated below which said carrier (said carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry in its usual place of delivery at said destination on its own route otherwise to deliver to another carrier on the route to said destination It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official Southern Western and Illinois Freight Classification in effect on the date thereof if this is a rail or rail water shipment or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which govern transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to Richard Gebauer

(Mail or street address of consignee—For purposes of notification)

Destination Johnson Co. Landfill State Mo Zip ____ County ____ Delivery Address ★ ____

★ To be filled in only when shipper desires and governing tariffs provide for delivery th

Route ____

Delivering Carrier A.E. Wolfe Car or Vehicle Initials ____ No. 807

No. Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*WEIGHT (Subject to Correction)	Class or Rate	Check Column
1	Contaminated Soil			
	6:30Am - 4:00Pm			
	9037-42			

Subject to Section 7 of Conditi applicable bill of lading, if this shipme be delivered to the consignee w recourse on the consignor the consign sign the following statement

The carrier shall not make delivery shipment without payment of freight other lawful charges

(Signature of Consignor)*

If charges are to be prepaid write o here "To be Prepaid"

Received $ ____ to apply in prepayment of the charge property described hereon

Agent or Cashier

Per ____ (The signature here acknowledges c amount prepaid.)

Charges Advanced

$ ____

* Shipper's imprint in lieu of stam part of Bill of Lading approved by t State Commerce Commission.

* If the shipment moves between two ports by a carrier by water the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ____ per ____

* The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification.

A. E. Wolfe Environmental Services Shipper, Per C. D. Gadlin Agent, Per ____

Kansas City, MO 64132

Permanent post-office address of shipper, 2001 East 23rd St

Straight Bill of Lading

WilsonJones - Carbonless - M 44-302 Quadruplicate

No. 6723

JOHNSON COUNTY LANDFILL
P.O. Box 866
Warrensburg, MO 64093

DATE 4-3 TIME 12:12P

COMPANY EST

WEIGHT METHOD TONS STATE FEE TOTAL

Weight ____ x $1.50 =

VOLUME METHOD | CUBIC YARDS | CONVERT TO TONS | TONS | STATE FEE | TOTAL

General Waste 10 x 0.33 = ____ x $1.50 =

Baled Waste ____ x 0.70 = ____ x $1.50 =

Heavy Waste ____ x 1.00 = ____ x $1.50 =

TOTAL ____

DRIVER C. D. Gadlin

REFERENCES

1. CH2M Hill, March 1983, Installation Restoration Program Records Search for Richards-Gebaur Air Force Base.

2. O'Brien & Gere, July 1990, Remedial Investigation (RI), Richards-Gebaur Air Force Base, Belton, Missouri.

3. Fenneman, Nevin M., 1938, Physiography of Eastern United States, McGraw-Hill and Co., New York and London.

4. Gentile, Richard J., 1984, Geology of the Belton Quadrangle, Missouri Department of Natural Resources, Division of Geology and Land Survey, Report of Investigations RI-69.

5. United States Department of Agriculture, Soil Conservation Service, 1984, Soil Survey of Jackson County, Missouri.

6. United States Department of Agriculture, Soil Conservation Service, 1985, Soil Survey of Cass County, Missouri.

REFERENCES

7.0 CONCLUSIONS

Fifty-seven cubic yards of contaminated soil were removed from Sites SS03 and SS04 at RGAFB. Forty-two cubic yards were removed from Site SS03 and 15 cubic yards from Site SS04. Soil sampling was conducted for the subgrade of the excavations. Soil samples were analyzed for TPH and lead. Analytical results for the final subgrade soil samples were all less than the clean-up goals of 100 mg/kg TPH and 238 mg/kg lead. Upon receipt of the analytical results, both excavations were backfilled with clean fill material and the sites were restored to their original conditions. No further remediation is recommended for Sites SS03 and SS04.

275 42

Best Available Copy

JOHNSON COUNTY LANDFILL
P.O. Box 866
Warrensburg, MO 64093

No. D 14_

DATE 4-3 TIME 9:10

COMPANY EST

WEIGHT METHOD TONS STATE FEE TO

Weight 10 Barrels x $1.50 =

VOLUME METHOD	CUBIC YARDS	CONVERT TO TONS	TONS	STATE FEE	TO
General Waste	____	x 0.33 =	____	x $1.50 =	
Baled Waste	____	x 0.70 =	____	x $1.50 =	
Heavy Waste	____	x 1.00 =	____	x $1.50 =	

TOTAL

DRIVER [illegible signature]

This Memorandum is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading nor a copy or duplicate covering the property named herein and is intended solely for filing or record

Shipper's No. 3298

Carrier's No. 80

(Name of Carrier)

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of the Bill of Lading,

at Kansas City, MO 64132 04-03 1992 From A. E. Wolfe Environmental Services

the property described below, in apparent good order except as noted (contents and condition of contents of packages unknown), marked, consigned and destined as indicated below which said co... word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said desti... on its own route otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to de... and as to each party at any time interested in all or any of said property that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Strai... Lading set forth (1) in Official Southern, Western and Illinois Freight Classification in effect on the date thereof, if this is a rail or rail-water shipment or (2) in the applicable motor carrier classificatio... if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which go... transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns

Consigned to Richard Gabaur

(Mail or street address at consignee—For purposes of notificat...

Destination Johnson County Landfill State MO Zip____ County ____ Delivery Address ★ ____

★ To be filled in only when shipper desires and governing tariffs provide for deliver...

Route

Delivering Carrier A. E. Wolfe / ESE Car or Vehicle Initials ____ No. 80

No. Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*WEIGHT (Subject to Correction)	Class or Rate	Check Column
	Contaminated Soil			
	9037-421			
	0630 Am - 12:30 Am			

Subject to Section 7 of Cond... applicable bill of lading, if this ship... be delivered to the consignee... recourse on the consignor, the cons... sign the following statement.
The carrier shall not make deliv... shipment without payment of freig... other lawful charges

(Signature of Consignor)

If charges are to be prepaid, writ... here: "To be Prepaid."

Received $ ____ to apply in prepayment of the char... property described hereon

Agent or Cashier

Per ____ (The signature here acknowledge... amount prepaid.)

Charges Advanced.

$ ____

† Shipper's imprint in lieu of st... part of Bill of Lading approved by... state Commerce Commission.

* If the shipment moves between two ports by a carrier by water the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.

NOTE—Where the rate is dependent on value shippers are required to state specifically in writing the agreed or declared value of the property.
The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ____ per ____

† The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification

A. E. Wolfe Environmental Services Shipper, Per ____ Agent, Per ____

Kansas City, MO 64132

Permanent post-office address of shipper. 3021 East 83rd St.

Straight Bill of Lading

WilsonJones - Carbonless 44-302 Quadruplicate

275 43

Best Available Copy

No. 6122

JOHNSON COUNTY LANDFILL
P.O. Box 866
Warrensburg, MO 64093

DATE 4-3 TIME 11:15
COMPANY EST

WEIGHT METHOD TONS STATE FEE TO

Weight ______ x $1.50 =

VOLUME METHOD CUBIC YARDS CONVERT TO TONS TONS STATE FEE T

General Waste 10 x 0.33 = ______ x $1.50 =
Baled Waste ______ x 0.70 = ______ x $1.50 =
Heavy Waste ______ x 1.00 = ______ x $1.50 =

TOTAL

DRIVER Joe Wilach

Memorandum is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record

Shipper's No 28425

Carrier's No ______

(Name of Carrier)

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of the Bill of Lading,

at Kansas City, MO 64132 19 From A. E. Wolfe Environmental Services

the property described below in apparent good order except as noted (contents and conditions of contents of packages unknown) marked, consigned and destined as indicated below which said carr[ier] word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destin[ation] on its own route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to desti[nation] and as to each party at any time interested in all or any of said property that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight [Bill of] Lading set forth (1) in Official, Southern, Western and Illinois Freight Classification in effect on the date thereof if this is a rail or rail-water shipment or (2) in the applicable motor carrier classification [or tariff] if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which gove[rns the] transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to EST (Mail or street address of consignee—For purposes of notificatio[n only])

Destination JC Landfill State ______ Zip ______ County ______ Delivery Address ★ ______

★ To be filled in only when shipper desires and governing tariffs provide for delivery t[hereat]

Route ______

Delivering Carrier ______ Car or Vehicle Initials ______ No. ______

No Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*WEIGHT (Subject to Correction)	Class or Rate	Check Column
	Dirt Haul at SFB			
		~~18~~ cu yds		
	[illegible]	10 cubic yards		
	7:00 am to 5:30 pm			
	1/2 hrs			

Subject to Section 7 of Condit[ions of] applicable bill of lading, if this shipm[ent is to] be delivered to the consignee w[ithout] recourse on the consignor, the consign[or shall] sign the following statement.
The carrier shall not make delivery [of this] shipment without payment of freight [and all] other lawful charges

(Signature of Consignor)

If charges are to be prepaid write o[r stamp] here. "To be Prepaid."

Received $ ______ to apply in prepayment of the charge[s on the] property described hereon

Agent or Cashier

Per ______ (The signature here acknowledges [only the] amount prepaid.)

Charges Advanced

$ ______

* If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ______ per ______

† The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification

† Shipper's imprint in lieu of stam[p; not a] part of Bill of Lading approved by t[he Inter]state Commerce Commission

A. E. Wolfe Environmental Services Shipper, Per ______ Agent, Per ______

Kansas City, MO 64132

Straight Bill of Lading

Permanent post-office address of shipper 3001 East 83rd St.

275 44

Best Available Copy

JOHNSON COUNTY LANDFILL
P.O. Box 866
Warrensburg, MO 64093

No. 0131

DATE 4-2 TIME 3:3

COMPANY [illegible]

WEIGHT METHOD	TONS	STATE FEE	TOT
Weight ____		x $1.50 =	

VOLUME METHOD	CUBIC YARDS	CONVERT TO TONS	TONS	STATE FEE	TO
General Waste	10	x 0.33 =		x $1.50 =	
Baled Waste		x 0.70 =		x $1.50 =	
Heavy Waste		x 1.00 =		x $1.50 =	

TOTAL

DRIVER [illegible signature]

Ium is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading nor a copy or duplicate covering the property named herein and is intended solely for filing or record

Shipper's No 2342

(Name of Carrier) Carrier's No

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of the Bill of Lading,
at Kansas City, MO 64132 19 From A. E. Wolfe Environmental Services

the property described below, in apparent good order, except as noted (contents and conditions of contents of packages unknown), marked consigned, and destined as indicated below, which said c... word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said dest... on its own route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to de... and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Strai... Lading set forth (1) in Official, Southern, Western and Illinois Freight Classification in effect on the date thereof if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classificatio... if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which go... transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns

Consigned to [illegible]

(Mail or street address at consignee—For purposes of notificat...

Destination ____ State ____ Zip ____ County ____ Delivery Address ★ ____

★ To be filled in only when shipper desires and governing tariffs provide for delivery

Route ____

Delivering Carrier ____ Car or Vehicle Initials ____ No. ____

No. Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*WEIGHT (Subject to Correction)	Class or Rate	Check Column
		10	Cubic	YARDS

Subject to Section 7 of Condi... applicable bill of lading, if this shipm... be delivered to the consignee ... recourse on the consignor the consi... sign the following statement:
The carrier shall not make delive... shipment without payment of freigh... other lawful charges.

(Signature of Consignor)

If charges are to be prepaid, write here, "To be Prepaid."

Received $ ____ to apply in prepayment of the charg... property described hereon

Agent or Cashier

Per ____ (The signature here acknowledges amount prepaid.)

Charges Advanced.

$ ____

* If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ____ per ____

† The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification.

† Shipper's imprint in lieu of stam... part of Bill of Lading approved by t... state Commerce Commission

A. E. Wolfe Environmental Services Shipper, Per ____ Agent, Per ____

Kansas City, MO 64132
3001 East 83rd St.

Permanent post-office address of shipper.

Straight Bill of Lading

WilsonJones • Carbonless • M...
44-302 Quadruplicate

275 45

Best Available Copy

No. 6131

JOHNSON COUNTY LANDFILL
P.O. Box 866
Warrensburg, MO 64093

DATE 4-3 TIME 6:39

COMPANY EST

WEIGHT METHOD TONS STATE FEE

Weight ______ x $1.50 =

VOLUME METHOD — CUBIC YARDS — CONVERT TO TONS — TONS — STATE FEE

General Waste 20 x 0.33 = 6 x $1.60 =

Baled Waste ______ x 0.70 = ______ x $1.50 =

Heavy Waste ______ x 1.00 = ______ x $1.50 =

TOTAL ______

DRIVER [signature]

This Memorandum is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading nor a copy or duplicate, covering the property named herein and is intended solely for filing or record

Shipper's No 28425

Carrier's No ______

(Name of Carrier)

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of the Bill of Lading,

at Kansas City, MO 64132 4-2 1992 From A. E. Wolfe Environmental Services

the property described below in apparent good order except as noted (contents and conditions of contents of packages unknown) marked consigned, and destined as indicated below which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own route otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western and Illinois Freight Classification in effect on the date thereof if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to US AIR FORCE

(Mail or street address at consignee—For purposes of notification only)

Destination Jo. Co. Landfill State MO Zip ______ County ______ Delivery Address ★ ______

★ To be filled in only when shipper desires and governing tariffs provide for delivery thereat

Route ______

Delivering Carrier ______ Car or Vehicle Initials 787 No. 774

No. Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*WEIGHT (Subject to Correction)	Class or Rate	Check Column
	HAUL DIRT TO LANFILL			
		16 YDS		
	7037-421			

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement.
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

______ (Signature of Consignor)

If charges are to be prepaid write or stamp here: "To be Prepaid."

Received $ ______ to apply in prepayment of the charges on the property described hereon

______ Agent or Cashier

Per ______ (The signature here acknowledges only the amount prepaid.)

Charges Advanced.

$ ______

* If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ______ per ______

* The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification.

* Shipper's imprint in lieu of stamp; not a part of Bill of Lading approved by the state Commerce Commission

A. E. Wolf Environmental Services Shipper, Per [signature] Agent, Per ______

Permanent post-office address of shipper ~~2001 East 83rd St.~~ Kansas City, MO 64132

Straight Bill of Lading

WilsonJones - Carbonless - MADE
44-302 Quadruplicate

275 46

Best Available Copy

JOHNSON COUNTY LANDFILL
P.O. Box 866
Warrensburg, MO 64093

No ______

DATE 4-2 TIME 1:13
COMPANY ESI #6032

WEIGHT METHOD TONS STATE FEE TOT
Weight ______ x $1.50 =

VOLUME METHOD	CUBIC YARDS	CONVERT TO TONS	TONS	STATE FEE	TOT
General Waste	18	x 0.33 =		x $1.50 =	
Baled Waste		x 0.70 =		x $1.50 =	
Heavy Waste		x 1.00 =		x $1.50 =	

TOTAL ______

DRIVER Roger D. Fitzgerald

---

his Memorandum

is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record

Shipper's No 32059

ESI
(Name of Carrier) Carrier's No ______

ECEIVED, subject to the classifications and tariffs in effect on the date of the issue of the Bill of Lading,
Kansas City, MO 64132 4-2 19 92 From A. E. Wolfe Environmental Services

e property described below in apparent good order except as noted (contents and conditions of contents of packages unknown) marked consigned and destined as indicated below which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western and Illinois Freight Classification in effect on the date thereof if this is a rail or rail-water shipment or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

onsigned to ESI - Richards Gebaur - ...
(Mail or street address at consignee—For purposes of notification

estination Johnson County State Mo. Zip ______ County ______ Delivery Address ★ ______
★ To be filled in only when shipper desires and governing tariffs provide for delivery the

oute ______

elivering Carrier ______ Car or Vehicle Initials ESI No. 710

No Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*WEIGHT (Subject to Correction)	Class or Rate	Check Column
	Haul Dirt from Site to Landfill	18 cubic yards		
	9037-021			

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement.
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of Consignor)

If charges are to be prepaid write or stamp here "To be Prepaid"

Received $ ______
to apply in prepayment of the charges on the property described hereon

Agent or Cashier

Per ______
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ ______

† Shipper's imprint in lieu of stamp; not a part of Bill of Lading approved by the state Commerce Commission.

If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ______ per ______

The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification

A. E. Wolfe Environmental Services Shipper, Per Roy T. Martin Agent, Per ______
Kansas City, MO 64132
ermanent post office address of shipper 2001 East 93rd St.

Straight Bill of Lading

275 47

No 6712

JOHNSON COUNTY LANDFILL
P.O. Box 866
Warrensburg, MO 64093

DATE 1-2 TIME 2:15
COMPANY ESI

WEIGHT METHOD TONS STATE FEE TO
Weight ______ x $1.50 =

VOLUME METHOD CUBIC YARDS CONVERT TO TONS TONS STATE FEE TC
General Waste 18 x 0.33 = ______ x $1.50 =
Baled Waste ______ x 0.70 = ______ x $1.50 =
Heavy Waste ______ x 1.00 = ______ x $1.50 =

TOTAL

DRIVER

Best Available Copy

This Memorandum is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record

Shipper's No 3205

ESI
(Name of Carrier)

Carrier's No. ______

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of the Bill of Lading,
at Kansas City, MO 64132 1-2 19 9_ From A. E. Wolfe Environmental Services

the property described below in apparent good order, except as noted (contents and conditions of contents of packages unknown) marked consigned and destined as indicated below which said carrier word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination on its own route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western and Illinois Freight Classification in effect on the date thereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification if this is a motor carrier shipment.
Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to ESI - [illegible]
(Mail or street address of consignee—For purposes of notification)

Destination [illegible] State MO Zip ______ County ______ Delivery Address ★ ______
★ To be filled in only when shipper desires and governing tariffs provide for delivery t

Route ______

Delivering Carrier ______ Car or Vehicle Initials [illegible] No. 770

No. Packages	Kind of Package, Description of Articles, Special Marks and Exceptions	*WEIGHT (Subject to Correction)	Class or Rate	Check Column
	[illegible] Dirt [illegible]	18 cubic yds.	yard	
	[illegible]			
	[illegible]			

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of Consignor)

If charges are to be prepaid, write or stamp here, "To be Prepaid"

Received $ ______ to apply in prepayment of the charges on the property described hereon

Agent or Cashier

Per ______
(The signature here acknowledges only the amount prepaid.)

Charges Advanced.

$ ______

* If the shipment moves between two ports by a carrier by water the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.
NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.
The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ______ per ______

* The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification.

* Shipper's imprint in lieu of stamp; not a part of Bill of Lading approved by the Interstate Commerce Commission.

A. E. Wolfe Environmental Services Shipper, Per [signature] Agent, Per ______
Kansas City, MO 64132

Straight Bill of Lading

Permanent post-office address of shipper. 3001 East 83rd St.

WilsonJones - Carbonless - MADE
44-302 Quadruplicate

275 48

Best Available Copy

JOHNSON COUNTY LANDFIL
P.O Box 866
Warrensburg, MO 64093

No. 611

DATE 4-3 TIME 9:15
COMPANY ESE

WEIGHT METHOD TONS STATE FEE
Weight ______ x $1 50 =

VOLUME METHOD CUBIC YARDS / CONVERT TO TONS / TONS / STATE FEE
General Waste 20 x 0 33 = ______ x $1 50 =
Baled Waste ______ x 0 70 = ______ x $1 50 =
Heavy Waste ______ x 1 00 = ______ x $1 50 =

TOTAL

DRIVER

This Memorandum is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein and is intended solely for filing or record

Shipper's No 28427

(Name of Carrier) Carrier's No

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of the Bill of Lading,

at Kans. City, MO 64132 4/3 19 97 From A. E. Wolfe Environmental Services

the property described below, in apparent good order except as noted (contents and conditions of contents of packages unknown), marked, consigned and destined as indicated below which said carrier word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination on its own route otherwise to deliver to another carrier on the route to said destination It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination and as to each party at any time interested in all or any of said property that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Lading set forth (1) in Official, Southern, Western and Illinois Freight Classification in effect on the date thereof if this is a rail or rail water shipment, or (2) in the applicable motor carrier classification or if this is a motor carrier shipment

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof set forth in the classification or tariff which governs transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to US AIR FORCE

(Mail or street address of consignee—For purposes of notification

Destination Jo. Co. Landfill State MO Zip ______ County ______ Delivery Address ★

★ To be filled in only when shipper desires and governing tariffs provide for delivery th

Route

Delivering Carrier ______ Car or Vehicle Initials 788 No. 774

No. Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*WEIGHT (Subject to Correction)	Class or Rate	Check Column
	Haul Soil to Landfill			
		18 cubic yards		
		20 yds		
# 9027-471				

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor the consignor shall sign the following statement.
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges

(Signature of Consignor)

If charges are to be prepaid, write or stamp here "To be Prepaid."

Received $ ______ to apply in prepayment of the charges on the property described hereon

Agent or Cashier

Per ______ (The signature here acknowledges only the amount prepaid)

Charges Advanced:

$ ______

* If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ______ per ______

† The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification.

† Shipper's imprint in lieu of stamp, not a part of Bill of Lading approved by the Interstate Commerce Commission.

A. E. Wolfe Environmental Services Shipper, Per ______ Agent, Per ______

Permanent post-office address of shipper: Kansas City, MO 64132 ~~3001 East 83rd St.~~

Straight Bill of Lading

WilsonJones • Carbonless • MADE
44-302 Quadruplicate

No. 6725

JOHNSON COUNTY LANDFILL
P.O. Box 866
Warrensburg, MO 64093

DATE 4-22 TIME 1:15

COMPANY A.E. Wolfe #705

WEIGHT METHOD TONS STATE FEE TOT

Weight ____ x $1.50 =

VOLUME METHOD CUBIC YARDS CONVERT TONS STATE FEE TO

General Waste 18 x 0.33 = ____ x $1.50 =

Baled Waste ____ x 0.70 = ____ x $1.50 =

Heavy Waste ____ x 1.00 = ____ x $1.50 =

TOTAL ____

DRIVER ____

275 49

Best Available Copy

This Memorandum is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate covering the property named herein, and is intended solely for filing or record

Shipper's No. 22421

(Name of Carrier) Carrier's No. ____

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of the Bill of Lading.

at Kansas City MO 64132 4-2 19 92 From A.E. Wolfe Environmental Services

The property described below in apparent good order except as noted (contents and conditions of contents of packages unknown) marked, consigned and destined as indicated below, which said carr word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destina on its own route, otherwise to deliver to another carrier on the route to said destination It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destin and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Lading set forth (1) in Official, Southern, Western and Illinois Freight Classification in effect on the date thereof, if this is a rail or rail-water shipment or (2) in the applicable motor carrier classification o if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which gove transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to Kansas Energy

(Mail or street address of consignee—For purposes of notificatior

Destination JCD Landfill State MO Zip ____ County ____ Delivery Address ★ ____

★ To be filled in only when shipper desires and governing tariffs provide for delivery th

Route ____

Delivering Carrier ____ Car or Vehicle Initials TT No. 774

No. Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*WEIGHT (Subject to Correction)	Class or Rate	Check Column
	Haul dirt from			
	Job site at A.E.	18 cubic		
	Rose to landfill	yards		
	2227-421			

Subject to Section 7 of Conditi applicable bill of lading, if this shipme be delivered to the consignee w recourse on the consignor, the consign sign the following statement:

The carrier shall not make delivery shipment without payment of freight other lawful charges.

(Signature of Consignor)

If charges are to be prepaid, write or here, "To be Prepaid.

Received $ ____ to apply in prepayment of the charges property described hereon

Agent or Cashier

Per ____ (The signature here acknowledges o amount prepaid.)

Charges Advanced.

$ ____

† Shipper's imprint in lieu of stamp part of Bill of Lading approved by th state Commerce Commission.

* If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is carrier's or shipper's weight.

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ____ per ____

† The fibre boxes used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of the Consolidated Freight Classification.

A.E. Wolfe Environmental Services Shipper, Per ____ Agent, Per ____

Kansas City, MO 64132

Permanent post-office address of shipper, 3021 East 23rd St.

Straight Bill of Lading

Wilson-Jones • Carbonless • MAC
44-302 Quadruplicate

4-3-92 Johnson County Landfill has accepted from Environmental Specialist Inc.

5 loads	18 cu yds	
2 loads	10 cu yds	138 cu yds
1 load	20 cu yds	
1 load	12 Barrels	

of contaminated fuel soil

Mona Stapley

275 51

CHEMICAL DIVISION

KANSAS CITY TESTING LABORATO
1669 JEFFERSON
A.C. 816-842-7
KANSAS CITY, MISSOURI 64

March 30, 1992

Paul Wrabec
Environmental Specialist Inc.
3001 E. 83rd Street
Kansas City, Missouri 64130

Dear Mr. Wrabec:

Four soil samples from "Richards Gebaur A.F.B." were delivered to Kansas City Testing Laboratory on 3-27-92. The samples were analyzed under KCTL Job No. 8212-92-2009; C2903. The analysis results are detailed below.

BTEX by EPA Method 8020

Sample	Benzene	Toluene	Ethylbenzene	Total Xylenes
Spill Excavation	< 10	< 10	< 10	< 10
Water Line Excavation	< 10	< 10	< 10	< 10
Tank Excavation	< 10	< 10	< 10	< 10
Soil & Spill Composite from Drum	< 10	320	220	2220

BTEX results are in ug/Kg or parts p

TPH by EPA Method 418.1 with M

Sample	TPH (m
Spill Excavation	7106*
Water Line Excavation	46.4
Tank Excavation	24.9
Soil & Spill Composite from Drum	144.7

SS03

SS04

TPH results are in mg/Kg or parts per million. Detection limit 5 ppm.
* Extract was yellow in color

KANSAS CITY TESTING LABORATORY

Soil samples from "Richards Gebaur A.F.B."

Open Cup Flash Point by ASTM D92-85

Sample	Flash Point °F
Spill Excavation	> 200
Water Line Excavation	> 200
Tank Excavation	> 200
Soil & Spill Composite from Drum	> 200

Sam Ferro
Laboratory Manager

APPENDIX B

LABORATORY ANALYTICAL RESULTS

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name: BURNS & MCDONNELL ENGINEERING COMPANY
4800 EAST 63RD STREET
POST OFFICE BOX 419173
KANSAS CITY, MO 64141

Client ID: SS03-1 Project ID: USRGAFB

SWLO ID: 8030.04 Report: 8030.04

Collected: 11/19/91 Report Date: 12/18/91 Page: 1
Received: 11/20/91 Last Modified: Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		10	mg/kg	33	11/27/91	MODIFIED 418.1 (MO.)
		*** METALS ***				
LEAD		0.6	mg/kg	21.2	12/03/91	SW 7421

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATI
SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name:	BURNS & MCDONNELL ENGINEERING COMPANY 4800 EAST 63RD STREET POST OFFICE BOX 419173 KANSAS CITY, MO 64141		
Client ID:	SS03-1D	Project ID:	USRGAFB
SWLO ID:	8030.05	Report:	8030.05
Collected:	11/19/91	Report Date: 12/18/91	Page: 1
Received:	11/20/91	Last Modified:	Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		10	mg/kg	22	11/27/91	MODIFIED 418.1 (MO.)
		*** METALS ***				
LEAD		0.6	mg/kg	20.6	12/03/91	SW 7421

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATI(
SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name:	BURNS & MCDONNELL ENGINEERING COMPANY 4800 EAST 63RD STREET POST OFFICE BOX 419173 KANSAS CITY, MO 64141		
Client ID:	SS03-2	Project ID:	USRGAFB
SWLO ID:	8030.06	Report:	8030.06
Collected:	11/19/91	Report Date: 12/18/91	Page: 1
Received:	11/20/91	Last Modified:	Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDRDCARBONS		200	mg/kg	28000	11/27/91	MODIFIED 418.1 (MO.)
		*** METALS ***				
LEAD		0.6	mg/kg	22.6	12/03/91	SW 7421

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATI
SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name: BURNS & MCDONNELL ENGINEERING COMPANY
4800 EAST 63RD STREET
POST OFFICE BOX 419173
KANSAS CITY, MO 64141

Client ID: SS03-SP Project ID: USRGAFB

SWLO ID: 8030.07 Report: 8030.07

Collected: 11/19/91 Report Date: 12/18/91 Page: 1
Received: 11/20/91 Last Modified: Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		100	mg/kg	5100	11/27/91	MODIFIED 418.1 (MO.)
		*** METALS ***				
LEAD		0.6	mg/kg	63.1	12/03/91	SW 7421

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATIC
SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name: BURNS & MCDONNELL ENGINEERING COMPANY
4800 EAST 63RD STREET
POST OFFICE BOX 419173
KANSAS CITY, MO 64141

Client ID: SS03-RB Project ID: USRGAFB

SWLO ID: 8030.08 Report: 8030.08

Collected: 11/19/91 Report Date: 12/18/91 Page: 1
Received: 11/20/91 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		0.5	mg/l	ND	11/25/91	MODIFIED 418.1 (MO.)
		*** METALS ***				
LEAD		3.0	ug/l	ND	12/11/91	SW 7421

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITAT

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name: BURNS & MCDONNELL ENGINEERING COMPANY
4800 EAST 63RD STREET
POST OFFICE BOX 419173
KANSAS CITY, MO 64141-6173

Client ID: SS03-A Project ID: USRGAFB

SWLO ID: 8657.01 Report: 8657.01

Collected: 02/06/1992 Report Date: 02-07-1992 Page: 1
Received: 02/07/1992 Last Modified: Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		10	mg/kg	53	02/07/92	MODIFIED 418.1 (MO.)

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name: BURNS & MCDONNELL ENGINEERING COMPANY
4800 EAST 63RD STREET
POST OFFICE BOX 419173.
KANSAS CITY, MO 64141-6173

Client ID: SS03-B Project ID: USRGAFB

SWLO ID: 8657.02 Report: 8657.02

Collected: 02/06/1992 Report Date: 02-07-1992 Page: 1
Received: 02/07/1992 Last Modified: Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		10	mg/kg	12	02/07/92	MODIFIED 418.1 (MO.)

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name: BURNS & MCDONNELL ENGINEERING COMPANY
4800 EAST 63RD STREET
POST OFFICE BOX 419173
KANSAS CITY, MO 64141-6173

Client ID: SS03-C Project ID: USRGAFB

SWLO ID: 8657.03 Report: 8657.03

Collected: 02/06/1992 Report Date: 02-07-1992 Page: 1
Received: 02/07/1992 Last Modified: Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		10	mg/kg	ND	02/07/92	MODIFIED 418.1 (MO.)

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION
SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name: BURNS & MCDONNELL ENGINEERING COMPANY
4800 EAST 63RD STREET
POST OFFICE BOX 419173
KANSAS CITY, MO 64141-6173

Client ID: SS03-SP92 Project ID: USRGAFB

SWLO ID: 8657.04 Report: 8657.04

Collected: 02/06/1992 Report Date: 02-07-1992 Page: 1
Received: 02/07/1992 Last Modified: Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		20	mg/kg	2000	02/07/92	MODIFIED 418.1 (MO.)

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name: BURNS & MCDONNELL ENGINEERING COMPANY
4800 EAST 63RD STREET
POST OFFICE BOX 419173
KANSAS CITY, MO 64141-6173

Client ID: SS03-RB92 Project ID: USRGAFB

SWLO ID: 8657.05 Report: 8657.05

Collected: 02/06/1992 Report Date: 02-11-1992 Page: 1
Received: 02/07/1992 Last Modified: Matrix: Water

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		0.5	mg/l	ND	02/11/92	MODIFIED 418.1 (MO.)

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATION

SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name:	BURNS & MCDONNELL ENGINEERING COMPANY 4800 EAST 63RD STREET POST OFFICE BOX 419173 KANSAS CITY, MO 64141		
Client ID:	SS04-1	Project ID:	USRGAFB
SWLO ID:	8030.01	Report:	8030.01
Collected:	11/19/91	Report Date: 12/18/91	Page: 1
Received:	11/20/91	Last Modified:	Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		10	mg/kg	14	11/27/91	MODIFIED 418.1 (MO.)
		*** METALS ***				
LEAD		0.6	mg/kg	17.1	12/03/91	SW 7421

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATI
SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name:	BURNS & MCDONNELL ENGINEERING COMPANY 4800 EAST 63RD STREET POST OFFICE BOX 419173 KANSAS CITY, MO 64141		
Client ID:	SS04-2	Project ID:	USRGAFB
SWLO ID:	8030.02	Report:	8030.02
Collected:	11/19/91	Report Date: 12/18/91	Page: 1
Received:	11/20/91	Last Modified:	Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		10	mg/kg	15	11/27/91	MODIFIED 418.1 (MO.)
		*** METALS ***				
LEAD		0.6	mg/kg	15.4	12/03/91	SW 7421

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITAT
SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 W. ALBANY SUITE C BROKEN ARROW, OK 74012 918 251-2858

Client Name: BURNS & MCDONNELL ENGINEERING COMPANY
4800 EAST 63RD STREET
POST OFFICE BOX 419173
KANSAS CITY, MO 64141

Client ID: SS04-SP Project ID: USRGAFB

SWLO ID: 8030.03 Report: 8030.03

Collected: 11/19/91 Report Date: 12/18/91 Page: 1
Received: 11/20/91 Last Modified: Matrix: Soil

TEST	DATE EXTRACTED	DETECTION LIMIT	UNITS	RESULTS	DATE ANALYZED	METHOD REFERENCE
		*** INORGANICS ***				
PET. HYDROCARBONS		10	mg/kg	350	11/27/91	MODIFIED 418.1 (MO.)
		*** METALS ***				
LEAD		0.6	mg/kg	81.0	12/03/91	SW 7421

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
B = ANALYTE DETECTED IN BLANK AS WELL AS SAMPLE
I = UNABLE TO QUANTITATE DUE TO MATRIX INTERFERENCE
NA = NOT APPLICABLE
Methodology: SM = STANDARD METHODS, 16th EDITION, 1985
EPA = #EPA600/4-79-020, MARCH 1985

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS
D = SURROGATES DILUTED OUT
J = ESTIMATED VALUE: CONCENTRATION BELOW LIMIT OF QUANTITATI
SW = EPA METHODOLOGY, "#SW846", THIRD EDITION, NOVEMBER 1986

APPENDIX C

CHAIN-OF-CUSTODY RECORDS

Best Available Copy

Request For Chemical Analysis And Chain Of Custody Record

EMPLOYEE-OWNED
Burns & McDonnell
ENGINEERS - ARCHITECTS - CONSULTANTS
4800 East 63rd Street
Kansas City, MO 64130
(816) 333-4375

Document Control No : 2
(NA If Not Applicable)

Client :
Address .
City, State, Zip :
Telephone :
Attention : MARTHA HILDEBRANDT

Laboratory SOUTHWEST LAB OF OKLAHOMA
Address . 1700 W ALBANY, SUITE C
City, State, Zip . BROKEN ARROW, OK 74012
Telephone (918) 251-2858
Laboratory Reference Number

Project Number 91-804-3-008 Project Name USRCAFB

Sampler(s) (Signature) Carmelo Blanchini

Station Number	Station Location	Date	Time	Sample Type: Liquid	Solid	Gas	Comp	Grab	Number of Containers	Analysis: TPH	Remarks	Lab Sample Number
	SS03-A	02-06-91	10:25		X				1	X	RAPID TURNAROUND PLEASE	
	SS03-B		10:30		X				1	X		
	SS03-C		10:35		X				1	X		
	SS03-SP92		10:40		X				1	X		
	SS03-RB92		10:45	X					1	X		

Relinquished By (Signature)	Date/Time	Received By (Signature)	Relinquished By (Signature)	Date/Time	Received By . (Signature)
1. Carmelo Blanchini	02-06-92 3:00 PM		2		
Relinquished By (Signature)	Date/Time	Received By Laboratory (Signature)	Date/Time	Remarks	
			2/7/		

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Best Available Copy

Request For Chemical Analysis And Chain Of Custody Record

EMPLOYEE - OWNED
Burns & McDonnell
ENGINEERS - ARCHITECTS - CONSULTANTS
4800 East 63rd Street
Kansas City, MO 64130
(816) 333-4375

Document Control No (NA If Not Applicable): 1 OF 1

Client :
Address :
City, State, Zip
Telephone
Attention : JOHN DAVID LANGFORD

Laboratory : SOUTHWEST LAB OF OKLA.
Address 1700 WEST ALBANY, SUITE C
City, State, Zip BROKEN ARROW, OK 74012
Telephone (918) 251-2858
Laboratory Reference Number

Project Number 91-804-3.008 Project Name USRGAFB

Sampler(s) (Signature) Carmelo Blanchovic

Station Number	Station Location	Date	Time	Sample Type: Liquid	Solid	Gas	Comp	Grab	Number of Containers	Analysis: TPH	Pb						Remarks	Lab Sample Number
	SS04 - 1	11-19-91	10:40		X				2	X	X							
	SS04 - 2		10:50		X				2	X	X							
	SS04 - SP		11:00		X				2	X	X							
	SS03 - 1		1:40		X				2	X	X							
	SS03 - 1D		1:40		X				2	X	X							
	SS03 - 2		1 50		X				2	X	X							
	SS 03 - SP		2:00		X				2	X	X							
	SS03 - RB		2 30	X					2	X	X							

Relinquished By (Signature)	Date/Time	Received By (Signature)	Relinquished By (Signature)	Date/Time	Received By (Signature)
1 Carmelo Blanchovic	11-19-91 3:30 P		2		
Relinquished By (Signature)	Date/Time	Received By Laboratory (Signature)	Date/Time	Remarks	
			11/21/91		

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APPENDIX D

LABORATORY QUALITY CONTROL REPORTS

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2858

ANALYTICAL REPORT

BURNS & MCDONNELL ENGINEERING COMPANY
P.O. BOX 419173
KANSAS CITY, MO 64141-0173

REPORT: 8030

REPORT DATE: 12/18/91

SWLO IDENTIFICATION

SAMPLE NO.: 8030.01-8030.08
DATE RECEIVED: 11/20/91

QA/QC

DESCRIPTION		PARAMETER	RESULTS
METHOD BLANK	12/03/91	LEAD	< 0.60 mg/Kg
METHOD BLANK	12/11/91	LEAD	< 3.0 ug/L
BLANK SPIKE	12/03/91	LEAD	103% RECOVERY
BLANK SPIKE	12/11/91	LEAD	80% RECOVERY

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SOUTHWEST LABORATORY OF OKLAHOMA, INC

1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-285

CLIENT: BURNS & MCDONNELL ENGINEERING CO.
4800 EAST 63RD STREET
KANSAS CITY, MO 64130
ATTN: MARTHA HILDEBRANDT

REPORT: 8030a

DATE: 12-18-91

SAMPLE MATRIX: SOIL
SWLO # METHOD BLANK
PROJECT: USRGAFB
SAMPLE ID: SBLK11259101

PARAMETER	DET. LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
TOTAL PETROLEUM HYDROCARBONS	10.0	mg/kg	ND	11-25-91	MOD. 418.1

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
EPA = #EPA600/4-79-020, MARCH 1985

SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2858

CLIENT: BURNS & MCDONNELL ENGINEERING CO.
4800 EAST 63RD STREET
KANSAS CITY, MO 64130
ATTN: MARTHA HILDEBRANDT

REPORT: 8030b

DATE: 12-18-91

SAMPLE MATRIX: SOIL
SWLO # 8030.01
PROJECT: USRGAFB
DATE ANALYZED: 11-25-91
METHOD REFERENCE: MOD. 418.1
SAMPLE ID: SS04-1(MS)

TPH MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY DATA

	SPIKE CONC. (mg/kg)	SAMPLE CONC. (mg/kg)*	MS CONC. (mg/kg)*	MS PERCENT RECOVERY
TPH	667	14	586	86%

* = DILUTION FACTOR NOT APPLIED TO THESE CONCENTRATIONS

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SOUTHWEST LABORATORY OF OKLAHOMA, INC

1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-2858

CLIENT: BURNS & MCDONNELL ENGINEERING CO.
4800 EAST 63RD STREET
KANSAS CITY, MO 64130
ATTN: MARTHA HILDEBRANDT

REPORT: 8030c

DATE: 12-18-91

SAMPLE MATRIX: WATER
SWLO # METHOD BLANK
PROJECT: USRGAFB
SAMPLE ID: SBLK11229101

PARAMETER	DET. LIMIT	UNIT	RESULTS	DATE ANALYZED	METHOD REFERENCE
TOTAL PETROLEUM HYDROCARBONS	0.5	mg/l	ND	11-25-91	MOD. 418.1

ND = NOT DETECTED ABOVE QUANTITATION LIMIT
EPA = #EPA600/4-79-020, MARCH 1985

SOUTHWEST LABORATORY OF OKLAHOMA, INC

1700 West Albany • Broken Arrow, Oklahoma 74012 • Office (918) 251-2858 • Fax (918) 251-285

CLIENT: BURNS & MCDONNELL ENGINEERING CO.
4800 EAST 63RD STREET
KANSAS CITY, MO 64130
ATTN: MARTHA HILDEBRANDT

REPORT: 8030d

DATE: 12-18-91

SAMPLE MATRIX: WATER
SWLO # WS11229101
PROJECT: USRGAFB

LABORATORY CONTROL SPIKE

	SPIKE CONC. (mg/L)	CONTROL SAMPLE CONC. (mg/L)*	MS CONC. (mg/L)*	MS PERCENT RECOVERY
TPH	20.0	0	18.6	93.0%

* = DILUTION FACTOR NOT APPLIED TO THESE CONCENTRATIONS

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SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W Albany • Broken Arrow, Oklahoma 74012 • 918-251-2858 • FAX 918-251-2599

METHOD : TPH (MISSOURI MODIFICATION)
ANALYSIS DATE : 02/07/92

LABORATORY BLANK

MATRIX : Soil
SAMPLE ID. : SBLK02079201
SAMPLE AMOUNT : 30G DILUTION FACTOR: 1

	QUANTITATION LIMIT (mg/kg)	AMOUNT FOUND (mg/kg)
TPH	10.0	10.0 ND

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (mg/kg)	4582.01 SAMPLE CONC. (mg/kg) *	4582.01MS MATRIX SPIKE CONC. (mg/kg) *	PERCENT RECOVERY
TPH	667	0	710	106

	4582.01MD MATRIX SPIKE DUPLICATE CONC. (mg/kg) *	PERCENT RECOVERY	RECOVERY PERCENT DIFFERENCE
TPH	696	104	2 %

* DILUTION FACTORS NOT APPLIED TO THESE CONCENTRATIONS

DUPLICATE SAMPLE RESULTS

COMPOUND	SAMPLE CONC. (mg/kg)	DUPLICATE CONC. (mg/kg)	RELATIVE PERCENT DIFF. %
TPH			.0

SOUTHWEST LABORATORY OF OKLAHOMA, INC.
1700 W Albany • Broken Arrow, Oklahoma 74012 • 918-251-2858 • FAX 918-251-2599

METHOD : MISSOURI METHOD
ANALYSIS DATE : 02/11/92

LABORATORY BLANK

MATRIX : Water
SAMPLE ID. : WBLK02119201
SAMPLE AMOUNT : 1000 mL DILUTION FACTOR: 1

	QUANTITATION LIMIT (mg/L)	AMOUNT FOUND (mg/L)
TPH	.5	.5 ND

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

COMPOUND	SPIKE CONC. (mg/L)	CONTROL SAMPLE CONC. (mg/L) *	WS02119201 MATRIX SPIKE CONC. (mg/L) *	PERCENT RECOVERY
TPH	20.0	.0	17.8	89.0 %

	MATRIX SPIKE DUPLICATE CONC. (mg/L) *	PERCENT RECOVERY	RECOVERY PERCENT DIFFERENCE
TPH		.0 %	>>>>>> %

* DILUTION FACTORS NOT APPLIED TO THESE CONCENTRATIONS

DUPLICATE SAMPLE RESULTS

COMPOUND	SAMPLE CONC. (mg/L)	DUPLICATE CONC. (mg/L)	RELATIVE PERCENT DIFF.